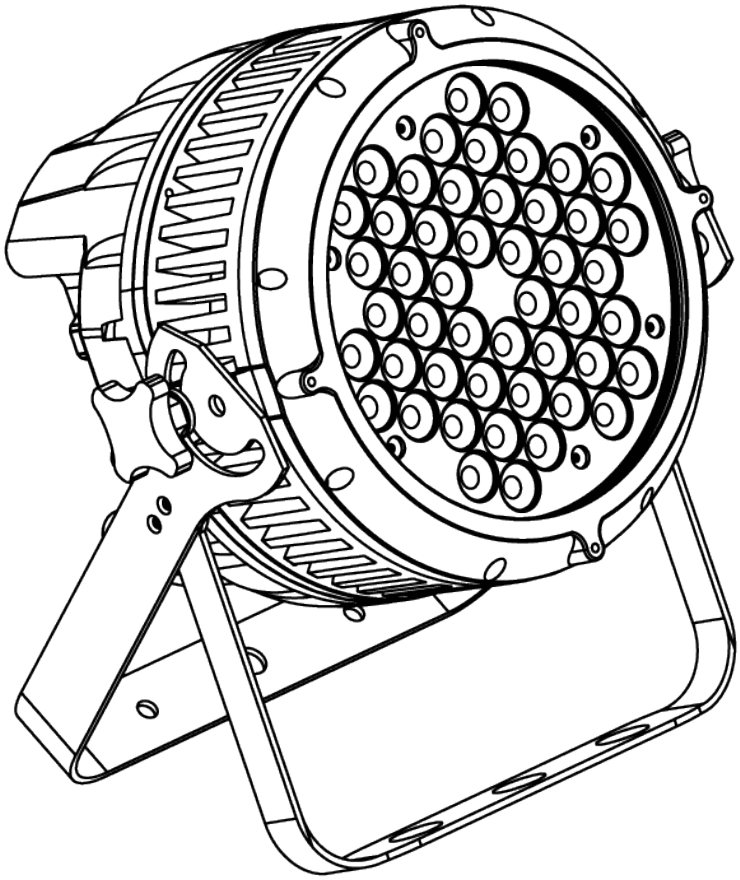
COLORADO™ 2 TOUR

User Manual



CHAUVET®

Edition Notes

CHAUVET® released this edition of the COLORado™ 2 Tour User Manual Rev. 01e in December 2009. The COLORado™ 2 Tour User Manual Rev. 01e covers the description, safety precautions, installation, programming, operation and maintenance of the COLORado™ 2 Tour fixture.

Trademarks

CHAUVET® is a registered trademark of CHAUVET & Sons Inc. (d/b/a CHAUVET® or Chauvet). The CHAUVET® logo in its entirety including the Chauvet name and the dotted triangle, and all other trademarks on this manual pertaining to services, products or marketing statements (example: It's Green Thinking™) are owned or licensed by CHAUVET®. Any other product names, logos, brands, company names, and other trademarks featured or referred to within this document are the property of their respective trademark holders.

Copyright Notice

CHAUVET® owns the content of this user manual in its entirety, including but not limited to pictures, logos, trademarks and resources.

© Copyright 2009 CHAUVET®

All rights reserved

Electronically published by CHAUVET® in the United States of America

Manual Usage

CHAUVET® authorizes its customers to download and print this manual for professional information purposes only. CHAUVET® expressly prohibits the usage, copy, storage, distribution, modification or printing of this manual or its content for any other purpose without its written consent.

Document Printing

For better results, print this document in color, on letter size paper (8.5 x 11 inches), double sided. If using A4 paper (210 x 297 mm), configure your printer to scale the content of this document to A4 paper.

Intended Audience

Any person in charge of installing, operating and/or maintaining the COLORado™ 2 Tour should read the Quick Start Guide that shipped with the COLORado™ 2 Tour fixture and this manual in their entirety before installing, operating or maintaining the COLORado™ 2 Tour.

Disclaimer

CHAUVET® believes that the information contained in this manual is accurate in all respects. However, CHAUVET® assumes no responsibility for any error or omissions in this document. CHAUVET® reserves the right to revise this document and to make changes from time to time in the content hereof without obligation of CHAUVET® to notify any person or company of such revision or changes. This does not constitute in any way a commitment by CHAUVET® to make such changes. CHAUVET® may issue a revision of this manual or a new edition of it to incorporate such changes.

CHAUVET® Publications Hot Line

If you have any comments about the accuracy of this document or general suggestions regarding how we can improve it, please call us at (800) 762-1084 (US callers) or +1-954-929-1115 (international callers), ext. 43. You can download the latest versions of all CHAUVET® products' manuals from www.chauvetlighting.com.

Document Revision

The COLORado™ 2 Tour User Manual Rev. 01e supersedes all previous versions of this manual. Please discard any older versions of this manual you may have, whether in printed or electronic format, and replace them with this version.

Fixture at a Glance

Use on Dimmer	X	Auto Programs	P
Outdoor Use	X	Auto-ranging Power Supply	P
Sound Activated	X	Replaceable Fuse	X
DMX	P	User Serviceable	X
Master/Slave	P	Duty Cycle	X

Table of Contents

1. Before you Begin 1

What is included 1
Unpacking Instructions 1
Text Conventions 1
Icons 1
Safety Notes 2
Expected LED Lifespan 2

2. Introduction 3

System Description 3
Features 3
Additional Features 3
Options 3
DMX Channel Summary 4
Product Overview 5

3. Setup 6

AC Power 6
Power Linking 6
AC Plug 6
Fuse Replacement 6
DMX Linking 6
DMX Connection 6
Master/Slave Linking 7
ID Addressing 7
Lens Assembly / Replacement 7
Mounting 8
Orientation 8
Rigging 8

4. Operation 9

Control Panel Description 9
Control Options 9
Programming 9
DMX Personality 9
DMX Control Without ID Addressing 9
DMX Control With ID Addressing 10
Static Color 10
Auto Programs 10
Edit Customs 10
Master/Slave 11
RGB to White 11
Power Setting 11
Dimmer Curves 11
Control Panel Lock 12
Program Upload 12
Reset 12
Whites Setting 12
White Balance 13
TOUR Notes 13
Master Dimmer 13
Red, Green & Blue & White Color Selection 13
Color Macros 13
Strobe 13
ID Address Selection 13
Auto 13
Dimmer Speed 13

COLORado™ 2 Tour Menu Map 14
DMX Values 15
TOUR *15*
TOUR (Cont.) *16*
ARC1 ..... *16*
ARC1 + D *16*
ARC2 ..... *16*
ARC2 + D *16*
ARC2 + S *17*
HSV *17*

5. Technical Information 18

General Maintenance 18
COLORado™ 2 Tour Troubleshooting Guide 19
Exploded View 20
Photometrics 21
Returns Procedure 22
Claims 22
Contact Us 22
Technical Specifications 23

6. Appendix 24

DMX Primer 24
The Physical Medium *24*
The Signals *24*
The Functions *24*
DMX Configuration 24
Starting Address *24*
Personalities *24*
Assigning Addresses *25*
DMX Universes *25*
DMX Connectivity 25
Fixture Location *25*
Number of Fixtures *25*
DMX Data Cabling *25*
Making your Own DMX Cable *25*
DMX Cable Characteristics *25*
DMX Cable Connectors *26*
3-Pin to 5-Pin Conversion Chart *26*
DMX Connection *26*
Master/Slave Linking 27
Master/Slave Connection *27*
Sizing the Circuit Breakers 29
Using the Spec Sticker *29*
Using the Watts/Volts Method *29*
Considering the Power Factor *29*
Using the Volt Amps Method *29*
Selecting the Circuit Breaker *29*

1. Before you Begin

What is included

- One COLORado™ 2 Tour
- One power cable with Edison plug (US)
- One barn doors frame
- Warranty Card
- Quick Start Guide

Unpacking Instructions

Immediately upon receiving the fixture, carefully unpack the carton. Check the box or flight case contents to ensure that all parts are present and that they are in good condition. If any part appears damaged from shipping, or if the carton shows signs of mishandling, notify the shipper immediately. In addition, retain the box and all the packing material for inspection.

In any event, save the carton and all packing material because, in case that you have to return the fixture to the factory, you will have to do so in its original box or flight case, with its original packing. See the *Claims* section in the *Technical Information* chapter.

Text Conventions

Convention	Meaning
1~512	A range of values
50/60	A set of mutually exclusive values in the text
[10]	A DIP switch to be configured
Claims	A fixture function, a new term, a section or a chapter
"COLORado™ UM"	The name of another publication or manual
<ENTER>	A key to be pressed on the fixture's control panel
Settings	A menu option that can be selected but not modified
MENU > Settings	A sequence of menu options to be followed
[1~10]	A range of menu values of which one can be selected
Yes/N*o*	A set of mutually exclusive menu options to choose
ON	A value to be entered or selected

Icons

Icons	Meaning
	This icon indicates critical installation, configuration or operation information. Failure to comply with this information may render the fixture partially or completely inoperative, damage third-party equipment, or cause harm to the user.
	This icon indicates important installation or configuration information. Failure to comply with this information may prevent the fixture from functioning correctly.
	This icon indicates useful, although non-critical information.

The term "DMX" used throughout this document refers to the USITT DMX512-A transmission protocol.

Safety Notes

Please read the following notes carefully because they include important safety information about the installation, usage and maintenance of this product.

It is important to read all these notes before starting to work with this product.

There are no user serviceable parts inside the COLORado™ 2 Tour. Any reference to servicing this unit you may find from now on in this User Manual will only apply to properly CHAUVET® certified technicians. Do not open the housing or attempt any repairs unless you are one of them.

Please refer to all applicable local codes and regulations for proper installation of the COLORado™ 2 Tour.

Keep this manual for future consultation. If you sell the COLORado™ 2 Tour to another user, make sure that they also receive this manual.

Personal Safety

- Avoid direct eye exposure to the light source(s) while they are on.
- Always disconnect the COLORado™ 2 Tour from its power source before servicing.
- Always connect the COLORado™ 2 Tour to a grounded circuit to avoid the risk of electrocution.
- Do not touch the COLORado™ 2 Tour's housing when operating because it may be very hot.

Mounting and Rigging

- This product is for indoor use only! To prevent risk of fire or shock, do not expose this product to rain or moisture.
- Make sure there are no flammable materials close to the fixture(s) while operating.
- When hanging this fixture, always secure it to a fastening device using a safety chain (not provided).

Power and Wiring

- Always make sure that you are connecting the COLORado™ 2 Tour to the proper voltage, as per the specifications in this manual or on the product's sticker.
- Never connect the COLORado™ 2 Tour to a dimmer pack.
- Make sure the controller's external voltage adapter housing or cable is not cracked, crimped or damaged.
- Never disconnect the fixture by pulling or tugging on the power cable.

Operation

- Maximum ambient temperature (Ta) is 104° F (40° C). Do not operate the fixture at a higher temperature.
- In case of a serious operating problem, stop using this product immediately!

In the unlikely event that your COLORado™ 2 Tour may require service, please contact CHAUVET® Technical Support.

Expected LED Lifespan

LEDs gradually decline in brightness over time, mostly because of heat. Packaged in clusters, LEDs exhibit higher operating temperatures than in ideal or singular optimum conditions. For this reason, using all color LEDs at their fullest intensity significantly reduces the LEDs' lifespan. Under normal conditions, this lifespan can be of 40,000 to 50,000 hours. If extending this lifespan expectancy is vital, lower the operational temperature by improving ventilation and reducing the external temperature, as well as limiting the overall projection intensity

2. Introduction

System Description

The COLORado™ 2 Tour is an RGBW wash light based on 48 LEDs. It consists of a single pod with a double bracket mounting yoke. The AC power comes directly into the fixture's housing through a NEUTRIK® powerCON A socket. The power linking uses a NEUTRIK® powerCON B socket. The DMX input and output sockets are of the 3-pin XLR type. The COLORado™ 2 Tour uses a display-based control panel for programming functions.

Features

- 3, 4, 5, 6 or 11-channel DMX LED wash light (with ID addressing)
- Operating modes (personalities)
  - 3-channel: RGB control
  - 3-channel: HSV control (hue, saturation and value)
  - 4-channel: RGBW control
  - 4-channel: RGB, dimmer
  - 5-channel: RGBW, dimmer
  - 6-channel: RGBW, dimmer, strobe
  - 11-channel: RGBW, ID, dimmer, strobe, macro, auto/custom, dimmer speed, auto speed
- RGBW color mixing with or without DMX controller
- Color temperature presets (3,200~10,000 K)
- Recall custom programs via DMX
- Recall custom programs via DMX

Additional Features

- High-power, 2~3 W (750~1,000 mA) LEDs
- Additional power output: max 5 units @ 120 V
- Adjustable barn doors to direct output (includes gel frame)
- LED display with lock-out feature
- NEUTRIK® powerCON connector
- 3-pin DMX input and output connectors

Options

- Top hat (C2TOP)
- Optical systems: 15° (installed), 30° (CLENS3048)

DMX Channel Summary

TOUR

DMX Channel	Function
1	Dimmer
2	Red
3	Green
4	Blue
5	White
6	Color Macro + White Balance + HyperColor™
7	Strobe
8	Programs
9	Auto Speed Adjust
10	Dimmer Speed
11	ID Address

ARC1

DMX Channel	Function
1	Red
2	Green
3	Blue

AR1 + D

DMX Channel	Function
1	Dimmer
2	Red
3	Green
4	Blue

ARC2

DMX Channel	Function
1	Red
2	Green
3	Blue
4	White

AR2 + D

DMX Channel	Function
1	Dimmer
2	Red
3	Green
4	Blue
5	White

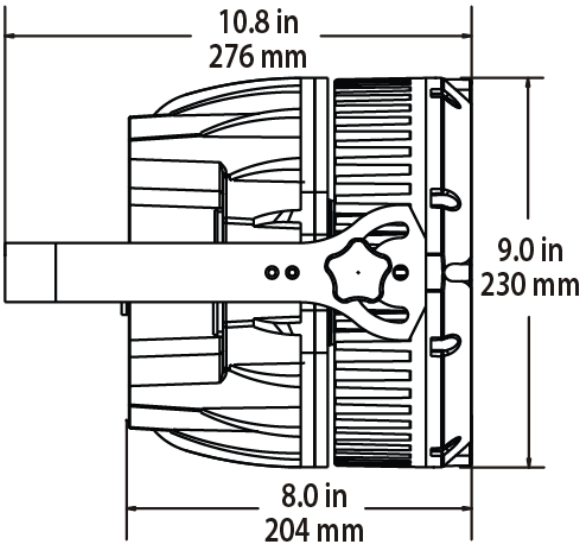
AR2 + S

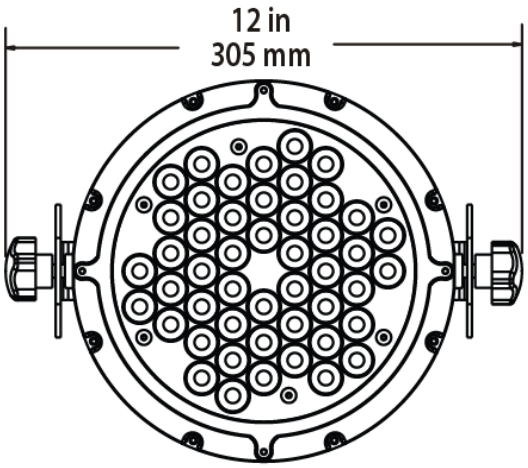
DMX Channel	Function
1	Dimmer
2	Red
3	Green
4	Blue
5	White
6	Strobe

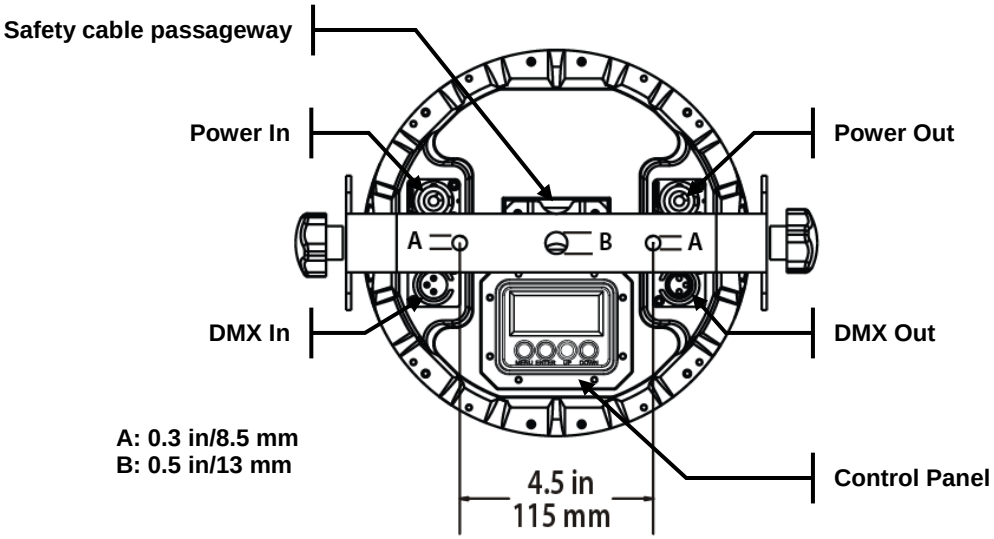
HSV

DMX Channel	Function
1	Hue
2	Saturation
3	Value

Product Overview







3. Setup

AC Power

The COLORado™ 2 has an auto-ranging power supply that can work with an input voltage range of 100~240 VAC, 50/60 Hz.

Make sure that you are connecting this product to the proper voltage, as per the specifications in this guide, the product's user manual or on the product's sticker.

Always connect the COLORado™ 2 Tour to a protected circuit with an appropriate electrical ground to avoid the risk of electrocution or fire.

To determine the power requirements for the COLORado™ 2 Tour see the label affixed to the side of the fixture. Alternatively, you may refer to the corresponding specifications chart in the *Technical Information* chapter of this manual.

The listed current rating indicates the maximum current draw during normal operation. Please refer to the *Sizing the Circuit Breakers* section in the *Appendix* chapter of this manual.

Never connect the COLORado™ 2 Tour to a rheostat (variable resistor) or dimmer circuit, even if the rheostat or dimmer channel serves only as a 0 to 100% switch.

Power Linking

The COLORado™ 2 Tour supports power linking for up to five other COLORado™ 2 Tour fixtures at 120 VAC. Each COLORado™ 2 Tour has Neutrik POWERCON sockets for Power In and Power Out. Although the fixture comes with a power input cord, it comes with no power linking cord.

AC Plug

The COLORado™ 2 Tour comes with a power input cord terminated with a NEUTRIK® powerCON A connector on one end an Edison plug on the other end (US market). If the power cord that came with your fixture has no plug or you need to change the Edison plug, use the table below to wire the new plug.

Connection	Wire (US)	Wire (Europe)	Screw Color
AC Live	Black	Brown	Yellow or Brass
AC Neutral	White	Blue	Silver
AC Ground	Green/Yellow	Green/Yellow	Green

Fuse Replacement

The COLORado™ 2 Tour fixture has no external fuse for the user to change. However, it does have an internal fuse that only an authorized CHAUVET® technician should change.

DMX Linking

If you are using the COLORado™ 2 Tour with a DMX controller, you can link them using a regular DMX serial connection. If using other DMX compatible fixtures with the COLORado™ 2 Tour, it is possible to control them individually with a single DMX controller.

It is also possible to run several DMX compatible fixtures synchronized without a DMX controller in a master/slave operating mode.

If you are not familiar with the DMX standard, please refer to the *DMX Primer* and *DMX Connectivity* sections in the *Appendix* chapter of this manual.

The *DMX Channel Summary* section in this chapter contains a brief description of what COLORado™ 2 Tour features have a DMX channel assigned to them. The *Operation* chapter of this manual provides a detailed list of the COLORado™ 2 Tour DMX channel assignments.

DMX Connection

The COLORado™ 2 Tour uses the DMX data connection for its DMX modes, ***TOUR***, ***ARC1***, ***AR1 + D***, ***ARC2***, ***AR2 + D***, ***AR2 + S*** and ***HSV***. Refer to the *Introduction* chapter for a brief description of this modes and the *Operation* Instructions chapter to learn how to configure the COLORado™ 2 Tour to work in these modes.

Master/Slave Linking

The Master/Slave mode allows one COLORado™ 2 Tour (the master) running a preconfigured program to control several other COLORado™ 2 Tour fixtures (the slaves) without requiring a DMX controller. In this mode, all the slave fixtures will operate in unison with the master fixture.

When in Master/Slave mode, the COLORado™ 2 Tour units link to each other by using the standard DMX connection.

If you are not familiar with the Master/Slave connectivity, please refer to the DMX Primer and DMX Connectivity sections in the *Appendix* chapter of this manual.

The *Operation* chapter of this manual provides detailed instructions on how to configure the Master and Slave units.

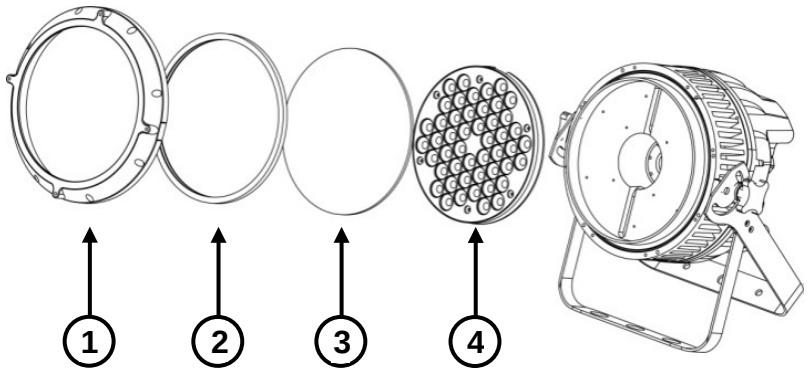
ID Addressing

The COLORado™ 2 Tour uses the ID Addressing feature to increase the number of addressable fixtures in the same DMX universe when in the TOUR personality. Refer to the *Operation* chapter in this manual to learn in detail how to configure the COLORado™ 2 Tour fixtures when using ID Addressing.

Lens Assembly / Replacement

The COLORado™ 2 Tour comes with the 15° lens assembly pre-installed from the factory. However, there is an optional lens kit **(CLENS3048)** available as an accessory, which will alter the beam angle of the fixture to 30º.

Follow the instructions below to to change or replace the LED lens assembly.



a) Disconnect the fixture from the AC power before opening it.

b) This procedure gives you direct access to the LEDs, which are very fragile. Use maximum care when handling the lenses over the LED assembly.

1) Remove the gel frame holder by removing the four thumbscrews (not shown).
2) Remove the front cover (1) by removing the eight Phillips #2 screws that hold it in place.
3) Remove the seal (2). Use caution, because the glass (3) is loose under this cover and it may fall.
4) Remove the glass cover to gain access to the lens assembly (4).
5) After removing the glass cover, remove the six Phillips #2 screws that hold the lens assembly in place.
6) Remove the existing lens assembly and replace it with the new lens assembly.
7) Reverse the process to complete the lens replacement.

Mounting

Read the safety notes at the beginning of this guide and follow their recommendations before mounting this product.

Orientation

Always mount this fixture in any safe position while making sure that there is adequate room around it for ventilation.

Make sure to mount this fixture away from any flammable material as indicated in the *Safety Notes*.

Rigging

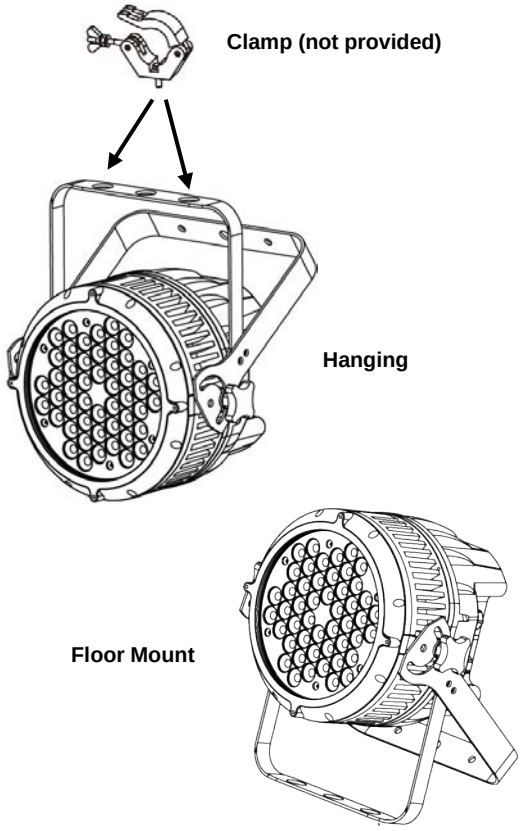
CHAUVET® recommends following the general guidelines below when mounting the COLORado™ 2 Tour.

- When selecting an installation location, consider ease of access to the fixture for operation, programming adjustments and routine maintenance.
- Never mount the fixture in places where rain, high humidity, extreme temperature changes or restricted ventilation may affect it.
- Make sure that the location where you are mounting the fixture can support its weight. Please see the *Technical Specifications* section of this manual for the weight requirement of this fixture.

Procedure

This fixture includes a mounting yoke to which you can attach one or two rigging clamps. You must supply your own "C" or "O" clamps and make sure that they are capable of supporting the weight of this fixture. CHAUVET® recommends using at least two mounting points per fixture.

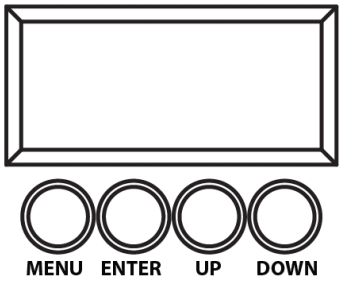
Product Mounting Diagram



4. Operation

Control Panel Description

Button	Function
<MENU>	Exits from the current menu or function
<ENTER>	Enables the currently displayed menu or sets the currently selected value into the current function
<UP>	Navigates upwards through the menu list or increases the numeric value when in a function
<DOWN>	Navigates downwards through the menu list or decreases the numeric value when in a function



Control Options

You can set the COLORado™ 2 Tour start address in the 001~512 DMX range. This allows for the control of up to 56 fixtures in the 11-channel TOUR personality. In addition, the ID address system allows you to assign up to 66 fixtures within the same DMX address, thus multiplying the number of fixtures you can control within a single universe. You can access the fixture's ID address system from channel 11 when in the TOUR personality.

When programming live performances as well as cues that need to trigger on demand or on a time line, program no more than 10 fixtures on ID addressing per DMX channel. This is to remain within a one-second execution time.

Programming

Carry out all the programming procedures indicated below from the control panel. Refer to the *Menu Map* on page 14 to learn how the menu options relate to each other.

DMX Personality

This setting allows the user to choose a particular DMX personality.

1) Press **<MENU>** repeatedly until ***PERS*** shows, and press **<ENTER>** to accept.
2) Use **<UP>** or **<DOWN>** to select the desired personality (**TOUR**, **ARC1**, **AR1 + D**, **ARC2**, **AR2 + D**, **AR2 + S**, or **HSV**).
3) Press **<ENTER>** to accept.
4) Press **<MENU>** to return to the main level.

DMX Control Without ID Addressing

In this mode, each unit will respond to a unique starting address from the DMX controller. All units with the same starting address will respond at unison.

1) Select the ***TOUR*** personality as shown in *DMX Personality*.
2) Set the running mode:
   a) Press **<MENU>** repeatedly until ***RUN*** shows, and press **<ENTER>** to accept.
   b) Use **<UP>** or **<DOWN>** to select ***DMX***, and press **<ENTER>** to accept.
   c) Press **<MENU>** to return to the main level.
3) Set the starting address:
   a) Press **<MENU>** repeatedly until ***DMX*** shows, and press **<ENTER>** to accept.
   b) Use **<UP>** or **<DOWN>** to select the starting address (**001~512**).
   c) Press **<ENTER>** to accept.
   d) Press **<MENU>** to return to the main level.
4) Deactivate ID Addressing in each fixture:
   a) Press **<MENU>** repeatedly until ***SET*** shows, and press **<ENTER>** to accept.
   b) Use **<UP>** or **<DOWN>** to select ***ID***, and press **<ENTER>** to accept.
   c) Use **<UP>** or **<DOWN>** to select ***OFF***, and press **<ENTER>** to accept.
   d) Press **<MENU>** twice to return to the main level.

Make sure to deactivate ID Addressing in each fixture when using the TOUR personality. Otherwise, unintended results may occur if channel 11 is not set to "0".

Programming (Cont.)

DMX Control With ID Addressing

In this mode, the fixtures with the same DMX starting address will respond to the DMX controller based on the fixture's individual ID address setting. If the user selects ID address "0", all the fixtures with the same DMX address will respond in unison. Otherwise, each fixture will follow the control for its particular ID address.

1) Repeat steps **1**, **2** and **3** from *DMX Control Without ID Addressing*.
2) Activate ID Addressing in each fixture:
   a) Press **<MENU>** repeatedly until ***SET*** shows, and press **<ENTER>** to accept.
   b) Use **<UP>** or **<DOWN>** to select ***ID***, and press **<ENTER>** to accept.
   c) Use **<UP>** or **<DOWN>** to select ***ON***, and press **<ENTER>** to accept.
   d) Press **<MENU>** twice to return to the main level.

Static Color

The Static Color mode allows for permanent RGBW color mixing without a DMX controller.

1) Press **<MENU>** repeatedly until ***STAT*** shows, and press **<ENTER>** to accept.
2) Use **<UP>** or **<DOWN>** to select the desired color (**Red**, **Green**, **Blue**, or **White**).
3) Press **<ENTER>** to accept.
4) Use **<UP>** or **<DOWN>** to select the desired color value (**0**~**255**).
5) Press **<ENTER>** to accept.
6) Repeat for the other colors.
7) Use **<UP>** or **<DOWN>** to select **Strob**, and press **<ENTER>** to accept.
8) Use **<UP>** or **<DOWN>** to select the desired frequency (**0**~**20**).
9) Press **<MENU>** twice to return to the main level.

Auto Programs

Auto programs allow for dynamic RGBW color mixing without a DMX controller.

1) Press **<MENU>** repeatedly until ***AUTO*** shows, and press **<ENTER>** to accept.
2) Use **<UP>** or **<DOWN>** to select the desired auto program (**AT. 01**~**10** or **PR. 01**~**10**).
3) Press **<ENTER>** to accept.

You cannot edit auto programs AT. 01~10. However you can edit PR. 01~10 (see *Edit Customs*).

Edit Customs

This setting allows the programming of up to 30 scenes for each of the 10 customizable programs, including colors and effects.

1) Press **<MENU>** repeatedly until ***EDIT*** shows, and press **<ENTER>** to accept.
2) Use **<UP>** or **<DOWN>** to select the desired auto program (**PR. 01**~**10**).
3) Press **<ENTER>** to accept.
4) Use **<UP>** or **<DOWN>** to select the desired scene (**SC. 01**~**30**).
5) Press **<ENTER>** to accept.
6) Use **<UP>** or **<DOWN>** to select the desired color or effect (**Red**, **Green**, **Blue**, **White**, **Strobe**, **Time** or **Fade**)
7) Press **<ENTER>** to accept.
8) Repeat for the other colors or effects.
9) Press **<MENU>** to return to the Scene level.
10) Repeat for the other scenes.
11) Press **<MENU>** to return to the main level once done.

Programming (Cont.)

Master/Slave

The Master/Slave mode allows a group of COLORado™ 2 Tour fixtures (the slaves) to execute simultaneously the same program, whether auto or custom, that another COLORado™ 2 Tour fixture (the master) is executing, and without a DMX controller.

Master/Slave (Cont.)

1) Set the Master Unit:
   a) Set the running mode to **DMX** as explained in "*DMX Control Without ID Addressing*"
   b) Select an Auto program as explained in "*Auto Programs*".
2) Set the slave units:
   a) Press **<MENU>** repeatedly until ***RUN*** shows, and press **<ENTER>** to accept.
   b) Use **<UP>** or **<DOWN>** to select ***SLAV***, and press **<ENTER>** to accept.
   c) Press **<MENU>** to return to the main level.

a) The fixture that runs an auto program automatically becomes the Master.

b) Do not connect a DMX controller to the master or slave fixtures.

RGB to White

The RGBW to White setting determines how the COLORado™ 2 Tour generates the white color based on the RGB settings.

1) Press **<MENU>** repeatedly until ***SET*** shows, and press **<ENTER>** to accept.
2) Use **<UP>** or **<DOWN>** to select ***RGBW***, and press **<ENTER>** to accept.
3) Use **<UP>** or **<DOWN>** to select **ON** or **OFF** and press **<ENTER>** to accept.
4) Press **<MENU>** to exit twice to exit to the main level.

When RGBW is set to ON, setting Red, Green and Blue to "255" will create a perfect white, albeit with a reduced output.

When RGBW is set to OFF, setting Red, Green and Blue to "255" will produce the maximum output, although with an imperfect white.

Power Setting

The Power Setting determines the power drawn by the COLORado™ 2 Tour.

1) Press **<MENU>** repeatedly until ***SET*** shows, and press **<ENTER>** to accept.
2) Use **<UP>** or **<DOWN>** to select ***POW***, and press **<ENTER>** to accept.
3) Use **<UP>** or **<DOWN>** to select **HIGH** or **NORM** and press **<ENTER>** to accept.

When POWER is set to HIGH, the light output is maximum and the power draw is 150 W.

When POWER is set to NORM, the light output is reduced and the power draw is 90 W.

Dimmer Curves

This setting determines the output of the COLORado™ 2 Tour based on the position of the Red, Green, Blue, White and Dimmer faders.

1) Press **<MENU>** repeatedly until ***SET*** shows, and press **<ENTER>** to accept.
2) Use **<UP>** or **<DOWN>** to select ***Dim***, and press **<ENTER>** to accept.
3) Use **<UP>** or **<DOWN>** to select a dimmer curve (**Off**, **Dim1**, **Dim2**, **Dim3** or **Dim4**).
4) Press **<ENTER>** to accept.

When Dim is set to "Off", the output is proportional (linear) to the Dimmer and RGB channel values.

When Dim is set to "Dim1" through "Dim4", the output follows the Dimmer and RGB channel values based on the corresponding dimmer curve, being Dim1 the fastest and Dim4 the slowest.

Programming (Cont.)

Control Panel Lock

This setting allows the user to activate or disable the control panel lock, which keeps non-authorized personnel from changing the fixture's settings.

1) Press **<MENU>** repeatedly until ***KEY*** shows, and press **<ENTER>** to accept.
2) Use **<UP>** or **<DOWN>** to select **On** or **Off**, and press **<ENTER>** to accept.

When the control panel lock is active, the fixture will prompt the user to enter the password after 30 seconds of control panel inactivity or after turning on the fixture.

After being prompted to enter the password:

1) Press **<UP>**, **<DOWN>**, **<UP>**, **<DOWN>** and **<ENTER>**

Program Upload

This option allows the user to copy the custom programs of one COLORado™ 2 Tour fixture onto other COLORado™ 2 Tour fixtures by using the Master/Slave method

1) Configure and connect the fixtures in a Master/Slave arrangement, where the master unit has the custom programs you want to transfer onto the slave units.
2) At the master unit, press **<MENU>** repeatedly until ***SET*** shows, and press **<ENTER>** to accept.
3) Use **<UP>** or **<DOWN>** to select **UPLD**, and press **<ENTER>** to accept.
4) When prompted, enter the master access password as shown in *Control Panel Lock*.
5) Wait for the upload process to finish before disconnecting the fixtures.

During and after the upload, the master and slave units will visually indicate the status of the process, as follows:

- **Yellow means that the upload is running.**
- **Red means that the upload failed due to an error.**
- **Green means that the upload completed successfully.**

Reset

This setting allows the user to reset the COLORado™ 2 Tour fixture to its default values, including the custom programs.

1) Press **<MENU>** repeatedly until ***SET*** shows, and press **<ENTER>** to accept.
2) Use **<UP>** or **<DOWN>** to select **REST**, and press **<ENTER>** to accept.
3) When prompted, enter the master access password as shown in *Control Panel Lock*.
4) Wait for the reset process to finish.

Whites Setting

This setting allows the user to select and edit the temperature of the white color. The 11 pre-set whites are configurable.

1) Press **<MENU>** repeatedly until ***CAL1*** shows, and press **<ENTER>** to accept.
2) Use **<UP>** or **<DOWN>** to select a white color (**WT. 1~11**).
3) Press **<ENTER>** to accept.

This selects the white color as it is. To edit it, do as follows:

4) Use **<UP>** or **<DOWN>** to select a color (**Red**, **Green**, **Blue** or **White**).
5) Press **<ENTER>** to accept.
6) Use **<UP>** or **<DOWN>** to select a color value (**0~255**).
7) Repeat for the other colors.
8) Press **<MENU>** to exit once done.

Programming (Cont.)

White Balance

This setting allows the user to select the white color shown by the COLORado™ 2 Tour when the DMX controller's Red, Green and Blue faders are set to "255".

1) Press **<MENU>** repeatedly until ***CAL2*** shows, and press **<ENTER>** to accept.
2) Press **<MENU>** again at ***RGBW***.
3) Use **<UP>** or **<DOWN>** to select a color (**Red**, **Green** or **Blue**).
4) Use **<UP>** or **<DOWN>** to select a color value (**0~255**).
5) Repeat for the other colors.
6) Press **<MENU>** to exit once done.

TOUR Notes

These notes intent to clarify the way the TOUR DMX personality works.

Master Dimmer

- Channel 1 controls the intensity of the currently projected color.
- When the slider is at the highest position (**255**) the intensity of the output is at its maximum

Red, Green & Blue & White Color Selection

- Channels, 2, 3, 4 and 5 control the intensity ratio of each of the Red, Green, Blue and White LEDs
- When the slider is at the highest position (255) the intensity of each color is at its maximum
- You can combine channels, 2, 3, 4 and 5 to create over 16 million colors

Color Macros

- Channel 6 selects the required Color Macro
- Channel 6 has priority over channels 2, 3, 4 and 5
- Channel 1 controls the intensity of the Color Macro

Strobe

- Channel 7 controls the strobe of channels 1~6
- Strobe 1 is with RGB in-step
- Strobe 2 is with RGB out-step
- Strobe 3 is a pulse strobe(fast on/slow off)
- Strobe 4 is a pulse strobe (slow on/fast off)
- Channel 7 has priority over channels 2, 3, 4 and 5

ID Address Selection

- Channel 9 selects the target ID address
- Each independent DMX address may have up to 66 independent ID addresses
- An ID address of **0** will activate all ID address locations

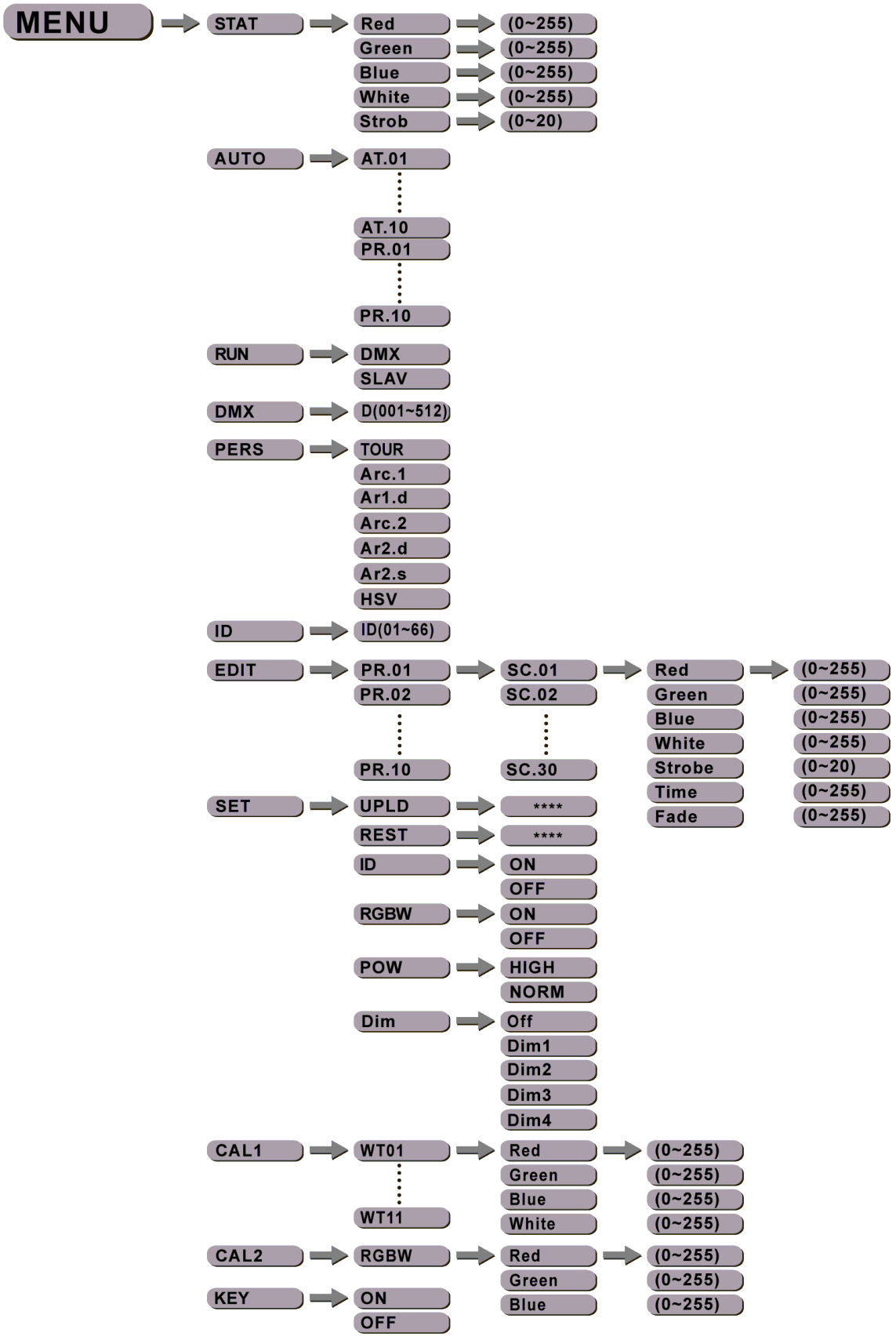
Auto

- Channel 8 selects the preset Auto programs **AT. 01~10** or the custom Auto programs **CUS. 01~10**
- When activating the custom Auto programs **CUS. 01~10**, it is possible to control the Step Time and Fade Time using channels 2 and 3 respectively
- Channel 8 has priority over channels 2, 3, 4, 5, 6 & 7

Dimmer Speed

- Channel 10 is for selecting the dimmer mode and speed. When ***Dimmer*** is set to **Off,** RGBW and Master Dimmer are linear. Otherwise, Dim1 is the fastest dimmer curve, while Dim4 is the slowest.

COLORado™ 2 Tour Menu Map



DMX Values

TOUR

Channel	Function	Value	Percent/Setting
1	**Master Dimmer**	000 ó 255	0~100%
2	**Red**	000 ó 255	0~100% (or Step Time when playing CUS. 01~10)
3	**Green**	000 ó 255	0~100% (or Fade Time when playing CUS. 01~10)
4	**Blue**	000 ó 255	0~100%
5	**White**	000 ó 255	0~100%
6	**Color Macro**	000 ó 005	No function
		006 ó 020	High Power (only when in NORMAL power mode)
		021 ó 030	No Function
		031 ó 050	Red 100% / Green Up / Blue 0%
		051 ó 070	Red Down / Green 100% / Blue 0%
		071 ó 090	Red 0% / Green 100% / Blue Up
		091 ó 110	Red 0% / Green Down ‘ Blue 100%
		111 ó 130	Red Up / Green 0% / Blue 100%
		131 ó 150	Red 100% / Green 0% / Blue Down
		151 ó 170	Red 100% / Green Up / Blue Up
		171 ó 190	Red Down / Green Down / Blue 100%
		191 ó 200	Red 100% / Green 100% / Blue 100% / White 100%
		201 ó 205	White 1: 3,200 K
		206 ó 210	White 2: 3,400 K
		211 ó 215	White 3: 4,200 K
		216 ó 220	White 4: 4,900 K
		221 ó 225	White 5: 5,600 K
		226 ó 230	White 6: 5,900 K
		231 ó 235	White 7: 6,500 K
		236 ó 240	White 8: 7,200 K
		241 ó 245	White 9: 8,000 K
		246 ó 250	White 10: 8,500 K
		251 ó 255	White 11: 10,000 K
7	**Strobe**	000 ó 010	No function
		011 ó 255	0~20 Hz
8	**Auto**	000 ó 020	No function
		021 ó 030	Auto 1
		031 ó 040	Auto 2
		041 ó 050	Auto 3
		051 ó 060	Auto 4
		061 ó 070	Auto 5
		071 ó 080	Auto 6
		081 ó 090	Auto 7
		091 ó 100	Auto 8
		101 ó 110	Auto 9
		111 ó 120	Auto 10
		121 ó 130	Custom 1
		131 ó 140	Custom 2
		141 ó 150	Custom 3
		151 ó 160	Custom 4
		161 ó 170	Custom 5
		171 ó 180	Custom 6
		181 ó 190	Custom 7
		191 ó 200	Custom 8
		201 ó 210	Custom 9
		211 ó 220	Custom 10
		221 ó 255	No function
9	**Auto Speed**	000 ó 255	0~100% (Only works if AUTO 01~10 is playing)
10	**Dimmer Speed**	000 ó 009	Use dimmer speed from control panel
		010 ó 029	Linear dimmer
		030 ó 069	Non-linear dimmer 1 (fastest)
		070 ó 129	Non-linear dimmer 2
		130 ó 189	Non-linear dimmer 3
		190 ó 255	Non-linear dimmer 4 (slowest)

(Continues next page)

DMX Values (Cont.)

TOUR (Cont.)

Channel	Function	Value	Setting	Value	Setting	Value	Setting
11	ID Address	000 ó 009	All IDs	212	ID 23	235	ID 46
		010 ó 019	ID 1	213	ID 24	236	ID 47
		020 ó 029	ID 2	214	ID 25	237	ID 48
		030 ó 039	ID 3	215	ID 26	238	ID 49
		040 ó 049	ID 4	216	ID 27	239	ID 50
		050 ó 059	ID 5	217	ID 28	240	ID 51
		060 ó 069	ID 6	218	ID 29	241	ID 52
		070 ó 079	ID 7	219	ID 30	242	ID 53
		080 ó 089	ID 8	220	ID 31	243	ID 54
		090 ó 099	ID 9	221	ID 32	244	ID 55
		100 ó 109	ID 10	222	ID 33	245	ID 56
		110 ó 119	ID 11	223	ID 34	246	ID 57
		120 ó 129	ID 12	224	ID 35	247	ID 58
		130 ó 139	ID 13	225	ID 36	248	ID 59
		140 ó 149	ID 14	226	ID 37	249	ID 60
		150 ó 159	ID 15	227	ID 38	250	ID 61
		160 ó 169	ID 16	228	ID 39	251	ID 62
		170 ó 179	ID 17	229	ID 40	252	ID 63
		180 ó 189	ID 18	230	ID 41	253	ID 64
		190 ó 199	ID 19	231	ID 42	254	ID 65
		200 ó 209	ID 20	232	ID 43	255	ID 66
		210	ID 21	233	ID 44		
		211	ID 22	234	ID 45		

ARC1

Channel	Function	Value	Percent/Setting
1	Red	000 ó 255	0~100%
2	Green	000 ó 255	0~100%
3	Blue	000 ó 255	0~100%

ARC1 + D

Channel	Function	Value	Percent/Setting
1	Master Dimmer	000 ó 255	0~100%
2	Red	000 ó 255	0~100%
3	Green	000 ó 255	0~100%
4	Blue	000 ó 255	0~100%

ARC2

Channel	Function	Value	Percent/Setting
1	Red	000 ó 255	0~100%
2	Green	000 ó 255	0~100%
3	Blue	000 ó 255	0~100%
4	White	000 ó 255	0~100%

ARC2 + D

Channel	Function	Value	Percent/Setting
1	Master Dimmer	000 ó 255	0~100%
2	Red	000 ó 255	0~100%
3	Green	000 ó 255	0~100%
4	Blue	000 ó 255	0~100%
5	White	000 ó 255	0~100%

ARC2 + S

Channel	Function	Value	Percent/Setting
1	**Master Dimmer**	000 ó 255	0~100%
2	**Red**	000 ó 255	0~100%
3	**Green**	000 ó 255	0~100%
4	**Blue**	000 ó 255	0~100%
5	**White**	000 ó 255	0~100%
6	**Strobe**	000 ó 010 011 ó 255	No function 0~20 Hz

HSV

Channel	Function	Value	Percent/Setting
1	**Hue**	000 ó 255	0~100%
2	**Saturation**	000 ó 255	0~100%
3	**Value**	000 ó 255	0~100%

In HSV mode, *Hue* refers to the visible light, such as red, yellow, and cyan, etc. *Saturation* is the dominance of hue in the color; when saturation is at 100%, the color is at its purest. *Value* is the color's brightness; when value is at 100%, the color is at its brightest.

5. Technical Information

General Maintenance

To maintain optimum performance and minimize wear, the user should clean the fixtures frequently. Usage and environment are contributing factors in determining the cleaning frequency. As a rule, the user should clean the fixtures at least twice a month. Dust build up reduces light output performance and can cause overheating. This can lead to reduced light source life and increased mechanical wear.

For fixtures containing external optical lenses, the user should clean them periodically to optimize light output. The cleaning frequency depends on the environment in which the fixture operates. Damp, smoky or particularly dirty surrounding can cause greater accumulation of dirt on the unit's optics. Even in the cleanest type of surroundings, the user should clean the external optics at least once every 30 days. CHAUVET® recommends cleaning the fixture's external optics with a soft cloth using normal glass cleaning fluid.

To clean a fixture, follow the below recommendations:

- Unplug the fixture from power.
- Wait until the fixture is cold.
- Use a vacuum (or dry compressed air) and a soft brush to remove dust collected on the external vents and reachable internal components.
- Clean all external optics and glass surfaces with a mild solution of glass cleaner or isopropyl alcohol, and a soft, lint free cotton cloth or a lens cleaning tissue.
- Apply the solution directly to the cloth or tissue and drag any dirt and grime to the outside of the lens.
- Gently polish the external glass surfaces until they are free of haze and lint.
- When cleaning movable mirrors, to avoid scratching or damaging their surface, minimize the contact with the mirror surface to a minimum.

Always dry the external optics and glass surfaces carefully after cleaning them.

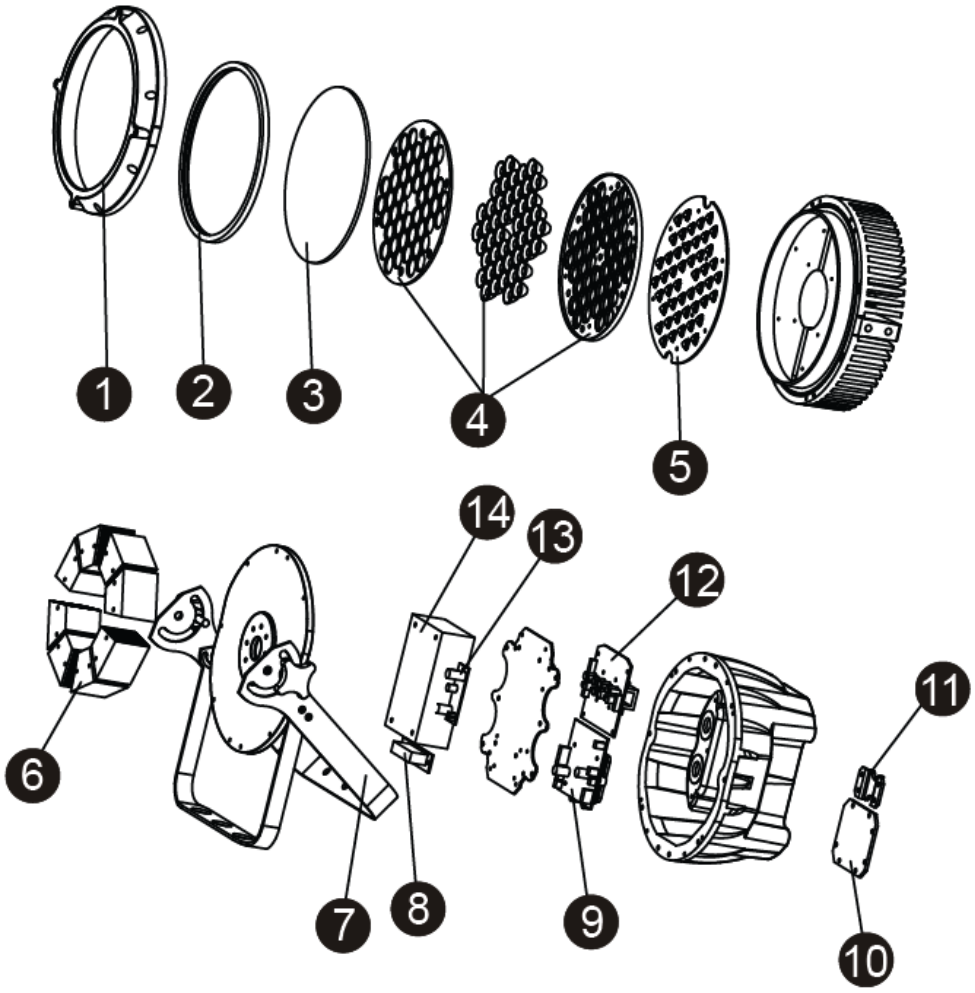
Never spin a fan using compressed air.

COLORado™ 2 Tour Troubleshooting Guide

Symptom	Cause(s)	Action(s)
General low light intensity	· Dirty lens assembly	· Clean the fixture regularly
	· Misaligned lens assembly	· Install lens assembly properly
A single LED (Red, Green, Blue or White), does not illuminate	· Faulty LED	· Replace the LED board
	· Faulty LED board	· Replace the LED board
A group LEDs (Red, Green, Blue or White), does not illuminate	· Faulty LED	· Replace the LED board
	· Faulty LED board	· Replace the LED board
	· Faulty LED driver	· Replace the LED driver board
None of the LEDs are illuminating	· Faulty LED PCB	· Replace the LED board
	· Faulty LED Driver PCB	· Replace the LED driver board
	· Faulty main PCB	· Replace the Display / Main board
Breaker/Fuse keeps blowing	· Excessive circuit load	· Check total load placed on the electrical circuit
	· Short circuit along the power wires	· Check for a short in the electrical wiring
Fixture does not power up	· No power	· Check for power on power outlet
	· Loose or damaged power cord	· Check power cord
	· Blown internal fuse	· Replace internal fuse (2 A, 250 V)
	· Faulty internal power supply	· Replace internal power supply
Fixture does not respond to DMX	· Wrong DMX addressing	· Check Control Panel and unit addressing
	· Damaged DMX cables	· Check DMX cables
	· Wrong polarity on the controller	· Check polarity switch settings on the controller
	· Loose DMX cables	· Check cable connections
	· Faulty DMX interface	· Replace Main PCB
	· Faulty Main PCB	· Replace Main PCB
DMX signal problems	· Non DMX cables	· Use only DMX compatible cables
	· Bouncing signals	· Install terminator as suggested
	· Long cable / low level signal	· Install an optically coupled DMX splitter right after fixture with strong signal
	· Too many fixtures	· Install an optically coupled DMX splitter after unit #32
	· Interference from AC wires	· Keep DMX cables separated from power cables or black lights

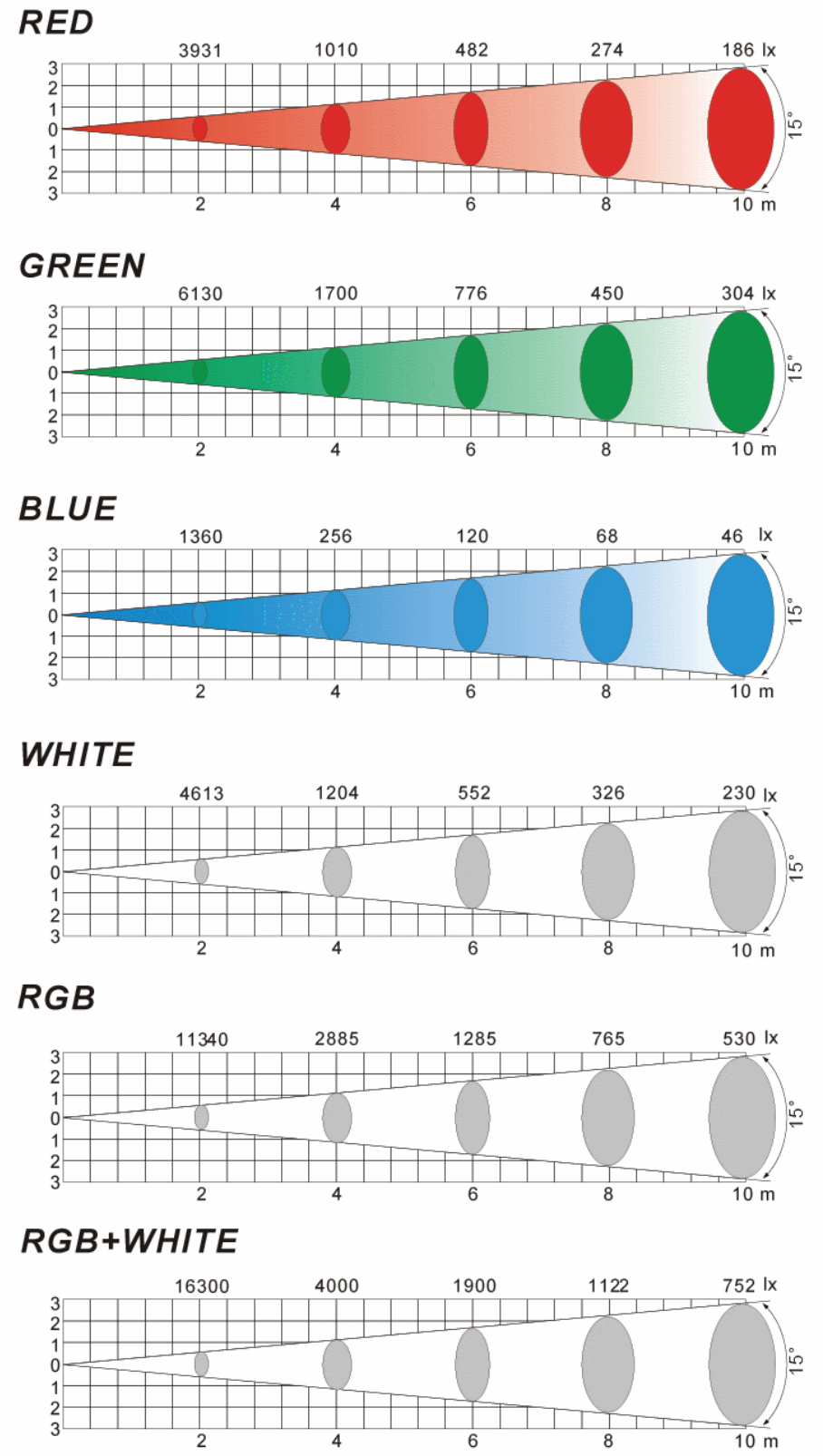
If you still experience technical problems after trying the above solutions, contact CHAUVET® Technical Support.

Exploded View



Item	Description	Part Code
1	Front cover	P111-C2FRNT
2	Rubber seal	P111-C2SEAL
3	Front tempered glass	P150-C2GLSM
4	Lens complete set	P111-C2TLEN
5	LED board	P222-C2LEDP
6	Heat sink	P111-C2HTSK
7	Bracket	P111-C2BRKT
8	Power connection board	P170-C2TPCNB
9	Display / Main board	P170-C2DISP
10	Display protection metal plate	P111-C2CVR
11	Safety chain plate	P111-C2SCP
12	LED driver board	P172-C2TDRVR
13	Voltage regulator board (5 V)	P170-5VREGP
14	Power supply (24 V)	P140-C2ELTR
Not Shown		
15	DMX In socket	P111-C2TDMXI
16	DMX Out socket	P111-C2TDMXO
17	Power input cable (Neutrik to Edison)	P111-80IPWRI
18	Power output cable (Neutrik to Edison)	P111-80IPWRO
19	Display/Master IC chip	P170-C2TMIC

Photometrics



Returns Procedure

The user must send the merchandise prepaid, in the original box, and with its original packing and accessories. CHAUVET® will not issue call tags.

Call CHAUVET® and request a Return Merchandise Authorization Number (RMA #) before shipping the fixture. Be prepared to provide the model number, serial number and a brief description of the cause for the return.

The user must clearly label the package with a Return Merchandise Authorization Number (RMA #). CHAUVET® will refuse any product returned without an RMA #.

DO NOT write the RMA # directly on the box. Instead, write it on a properly affixed label.

Once you are given an RMA #, please include the following information on a piece of paper inside the box:

- Your name
- Your address
- Your phone number
- The RMA #
- A brief description of the symptoms

Be sure to pack the fixture properly. Any shipping damage resulting from inadequate packaging will be the customer's responsibility. As a suggestion, proper UPS packing or double-boxing is always a safe method to use.

CHAUVET® reserves the right to use its own discretion to repair or replace returned product(s).

Claims

The shipper is responsible for any damage incurred during shipping. Therefore, if the merchandize appears damaged due to shipping, the customer's must submit the damage report and any related claims with the carrier, not CHAUVET®. The customer must submit the report upon reception of the damaged merchandise. Failure to do so in a timely manner may invalidate the customer's claim with the carrier.

For other issues such as missing components or parts, damage not related to shipping, or concealed damage, the customer must made claims to CHAUVET® within seven (7) days of receiving the merchandise.

Contact Us

World Wide

General Information

CHAUVET®
3000 North 29th Court
Hollywood, FL 33020
Voice: (954) 929-1115
Fax: (954).929-5560
Toll free: (800) 762-1084

Technical Support

Voice: (954) 929-1115 (Press **4**)
Fax: (954) 929-5560 (Attention: Service)

World Wide Web

www.chauvetlighting.com

It's Green Thinking

Technical Specifications

Weight & Dimensions

Length	10.8 in (276 mm)
Width	12 in (305 mm)
Height	9.0 in (230 mm)
Weight	20 lbs (9.1 kg)

Power

Auto-ranging	100~240 V, 50/60 Hz
Fuse (internal)	2 A, 250 V
Power Consumption	179.4 W (1.43 A) max @ 120 V, 178.9 W (0.78 A) max @ 230 V
Inrush Power	0.75 A @ 120 V, 0.81 A @ 230 V
Power Factor	1.00 @ 120 V, 0.99 @ 230 V
Power Linking	5 units max @ 120 V, 10 units max @ 230 V

Light Source

Type	3 W, 50,000 hrs LEDs
Configuration	48 units
Red	12 units, 750 mA
Green	12 units, 1,000 mA
Blue	12 units, 1,000 mA
White	12 units, 1,000 mA
Refresh rate	400 Hz

Photo Optic

Luminance @ 2 m (with included 15° degree lenses)	16,300 lux
Beam Angle @ 2 m (with included 15° degree lenses)	10°
Field Angle @ 2 m (with included 15° degree lenses)	23°

Thermal

Cooling	Natural convection
Maximum ambient temperature	104° F (40° C)

Control & Programming

Data input	Locking 3-pin XLR male socket
Data output	Locking 3-pin XLR female socket
Data pin configuration	Pin 1 shield, pin 2 (-), pin 3 (+)
Protocols	USITT DMX512-A
DMX Channels	3, 4, 5, 6, 11

Ordering Information

COLORado™ 2 Tour	COLORADO2TOUR

Warranty Information

Warranty	2-year limited warranty

INTERTEK ETL LISTED C US 3144482
CONFORMS TO UL STD. 1573
CERTIFIED TO CSA STD. C22.2 No. 166

6. Appendix

DMX Primer

The DMX protocol (USITT DMX512-A) is a networking protocol that enables a universal DMX controller device to control the features of multiple DMX compatible fixtures, whether par cans, wash lights, moving heads, followspots, foggers, proprietary fixture controllers, etc.

As any other networking protocol, the USITT DMX512-A describes the physical medium, the signals and the functions they control.

The Physical Medium

The DMX controller connects to it associated DMX compatible fixtures using a DMX connection. This connection consists of a series of jumps between the DMX controller and the various DMX compatible fixtures, also known as a daisy chain connection. In this type of connection, the DATA OUT of one fixture or the DMX controller connects to the DATA IN of the next fixture, and so on.

Each DMX fixture links to the previous and next DMX fixture or controller using a DMX cable. This type of cable consists of a section of shielded, two-conductor twisted pair cable with one 3-pin XLR male connector on one end and a 3-pin XLR female connector on the other end. The XLR connectors pin-out is as follows: pin 1 is the *Common* (shield), pin 2 is *Signal Negative* (S-) and pin 3 is *Signal Positive* (S+).

The Signals

The DMX signal stream is unidirectional, from the DMX controller to the DMX compatible fixtures. These signals conform to the EIA-485 standard.

The stream of DMX signals consists of 512 individual, sequential channels that form a frame. The DMX controller constantly sends frames of DMX signals to the DMX connection, even if not all of the 512 channels are in use. Because of this constant transmission method, there can be only one DMX controller in a DMX connection. Otherwise, the DMX signals sent by one controller would interfere with the signals sent by the other controller(s).

The Functions

Each DMX channel can have any unitary value in the 000~255 range. Each DMX compatible fixture uses as many consecutive DMX channels as features the user can control. The sequential numbers assigned to each DMX channel (1~512) are also known as DMX addresses.

The function each DMX channel has and the results of assigning a value to each depend on each controlled fixture. Some fixtures only use a single DMX channel, while others may require 15 or more DMX channels to control all their functions.

DMX Configuration

The DMX fixture configuration consists in determining how many channels each fixture will need as well as assigning the corresponding DMX channels to each fixture in order to size correctly the DMX controller.

Personalities

Most DMX fixtures use multiple personalities, each of them requiring a different number of channels, depending on the number of features it enables. The number of DMX channels used by a fixture may vary from only one (usually the general dimmer control) to 15 or more, as mentioned above.

When the job does not require using all the fixture's capabilities, the user can select a more basic personality (less channels), thus allowing the DMX controller to accommodate more DMX fixtures.

Starting Address

For the DMX controller to control each DMX fixture, the user must first configure each fixture's personality. This will determine the number of required channels to control the fixture. Each channel will have a DMX address assigned to it. However, since assigning a particular DMX address to each channel is impractical, the user will only need to configure on each fixture the DMX address that corresponds to the fixture's Channel 1. This is the fixture's starting address. The fixture will automatically assign the other channels to the subsequent DMX addresses.

Once this assignment is complete, and based on the number of channels it uses, the fixture will respond to the DMX signals sent to the range of DMX channels that begins with the starting address.

For example, a fixture that uses six DMX channels and whose starting address is 100, will accept DMX data sent by the DMX controller to channels 100, 101, 102, 103, 104, and 105.

DMX Configuration (Cont.)

Assigning Addresses

The user must carefully assign the starting addresses for each individual fixture to avoid DMX channel overlapping. If the DMX channels do overlap, the affected fixtures could operate erratically.

However, the user may decide to configure two or more similar fixtures with the same personality and starting address. In this case, all the fixtures with the same starting address will operate at unison.

DMX Universes

A DMX universe is the set of DMX compatible fixtures connected to the same DMX daisy chain, which are receiving DMX data from the same DMX controller using the same set of 512 DMX channels.

Although in most cases an installation will consist of only one DMX universe, it could be necessary to define two or more universes because of constrains imposed by the distance or the number of features.

Most DMX controllers support only one universe, although some DMX controllers may support two or more universes. Each universe will have its own separated DMX daisy chain. A DMX compatible fixture can only be part of a single DMX universe.

DMX Connectivity

Connecting the DMX fixtures to a DMX controller in small to medium installations is usually a rather simple operation that requires a minimum of tools and some planning (not including the actual fixture rigging and configuration).

However, in large installations it may be necessary to plan carefully the position and cabling of each fixture to avoid unexpected problems.

Fixture Location

The order in which the fixtures connect to the DMX controller is not important and it has no effect on how a controller communicates to each fixture. However, the user should always define a physical location for the fixtures that provides for the easiest and most direct cabling to the controller and other fixtures.

Number of Fixtures

When using a DMX controller, the combined number of channels required by all the fixtures on the serial data link determines the number of fixtures the DMX controller has to support. Conversely, the number of onboard sliders, page buttons and fixture buttons limits the number of discrete DMX channels a DMX controller can support.

To comply with the EIA-485 standard, which is the base for the USITT DMX512-A protocol, do not connect more than 32 fixtures without using a DMX optically-isolated splitter. Doing otherwise may result in deterioration of the digital DMX signal.

DMX Data Cabling

You must use DMX compliant data cables to link two or more DMX compatible fixtures. You may purchase CHAUVET® certified DMX cables directly from a dealer/distributor or construct your own cable.

USITT recommends limiting the total length of the DMX cable (from the first fixture/controller to the last fixture) to 300~455 m (985~1,500 ft).

Making your Own DMX Cable

If you choose to create your own DMX cable, make sure to use data-grade cables that can carry a high frequency signal and are less prone to electromagnetic interference. Use a Belden© 9841 or equivalent cable, which meets the specifications for EIA RS-485 applications.

Do not use standard microphone cables for DMX applications because they cannot transmit DMX data reliably over long distances.

DMX Cable Characteristics

The DMX data cable must have the following characteristics:

Type:	*shielded, 2-conductor twisted pair*
Maximum capacitance between conductors:	*30 pF/ft*
Maximum capacitance between conductor and shield:	*55 pF/ft*
Maximum resistance:	*20 ohms/1000 ft*
Nominal impedance:	*100~140 ohms*

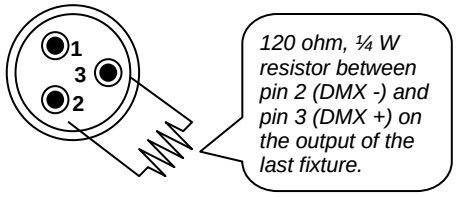
DMX Connectivity (Cont.)

DMX Cable Connectors

Each DMX cable must have a male, 3-pin XLR connector on one end and a female, 3-pin XLR connector on the other end.

DMX Connector Configuration

To avoid signal transmission problems and interference, it is always advisable to connect a DMX signal terminator, as seen below.



Test all DMX cables with an ohmmeter to verify their correct polarity and to make sure that there are no short-circuits between any of the pins, or between any pin and ground.

If the Common wire (shield) touched the chassis ground, a ground loop could form, which may cause the fixture to perform erratically.

3-Pin to 5-Pin Conversion Chart

If you use a DMX controller or fixture with a 5-pin DMX connector, you will need to use a 5-pin to 3-pin adapter. The chart below details a proper cable conversion.

3-Pin to 5-Pin Conversion Chart

Conductor	3-Pin Female (Output)	5-Pin Male (Input)
Ground/Shield	Pin 1	Pin 1
Negative (-) signal	Pin 2	Pin 2
Positive (+) signal	Pin 3	Pin 3
Not Used		Pin 4
Not Used		Pin 5

DMX Connection

Make sure that the fixtures with which you are working can operate in DMX mode, not in a proprietary connection mode. Refer to the fixtures' manual to learn how to enable their respective DMX modes.

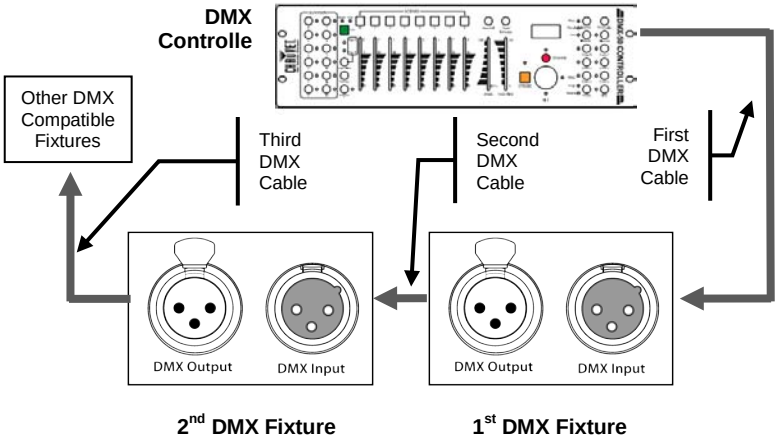
The procedure below illustrates a possible DMX connection method.

1) Connect the 3-pin, male connector of the first DMX cable to the DMX Output connector (3-pin, female) of the DMX controller.
2) Connect the 3-pin, female connector of the first DMX cable coming from the controller to the DMX Input connector (3-pin, male) of the first DMX fixture.
3) Connect the 3-pin, male connector of the second DMX cable to the DMX Output connector (3-pin, female) of the first DMX fixture.
4) Connect the 3-pin, female connector of the second DMX cable coming from the first DMX fixture to the DMX Input connector of the second DMX compatible fixture.
5) Continue linking the other DMX fixtures in the same way.

The figure in the next page is only an example of a possible DMX serial connection.

DMX Connectivity (Cont.)

Generic DMX Data Connection Diagram



Master/Slave Linking

The Master/Slave mode allows one fixture (the master) to run a preconfigured program to control several other fixtures of the same model (the slaves) without requiring a DMX controller. In this mode, all the slave fixtures will operate in unison with the master fixture.

If a fixture supports the Master/Slave mode, it will have some sort of programming function to configure it as master or slave. Those fixtures that only support DMX mode cannot operate in Master/Slave mode.

Master/Slave Connection

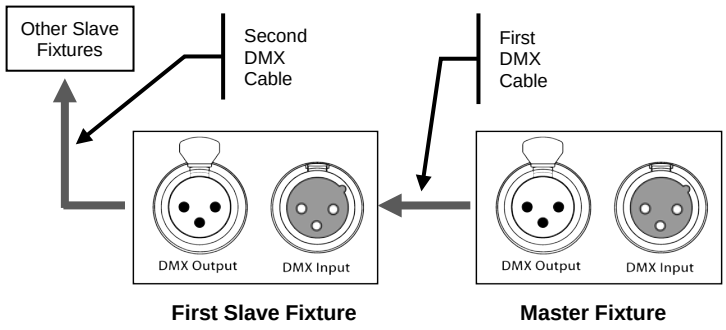
Make sure the fixtures with which you are working are capable of operating in Master/Slave mode. When working in Master/Slave mode, most fixtures use the DMX data connection as well. The difference in this case is that there is no DMX controller involved. Refer to the fixtures' manual to learn how to configure them to work in Master/Slave mode.

The procedure below illustrates a possible connection method.

Procedure

1) Connect the 3-pin, male connector of the first DMX cable to the DMX Output connector (3-pin, female) of the master fixture.
2) Connect the 3-pin, female connector of the first DMX cable coming from the master fixture to the DMX Input connector (3-pin, male) of the first slave fixture.
3) Connect the 3-pin, male connector of the second DMX cable to the DMX Output connector (3-pin, female) of the first slave fixture.
4) Connect the 3-pin, female connector of the second DMX cable coming from the first slave fixture to the DMX Input connector (3-pin, male) of the second slave fixture.
5) Continue linking the other slave fixtures in the same way.
6) Follow the steps in fixtures' manual to configure the fixtures as master and slaves.

Generic Master/Slave Connection Diagram



ID Addressing

ID Addressing is a sub-addressing method by which each fixture, apart from its starting address, can also have an "ID" address in the 1~66 range. This allows users to multiply the number of fixtures they can control with a single DMX controller.

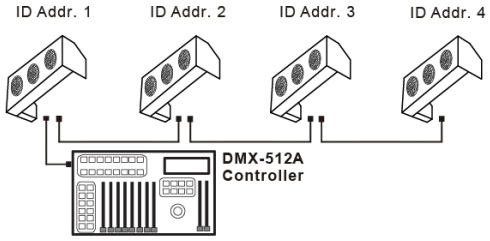
Many fixtures have at least one DMX personality or mode that enables ID addressing. In this case, one of the channels of such DMX mode is in charge of selecting an ID address. When using ID addressing, setting the value of the ID addressing channel to "0" allows for the simultaneous control of all the fixtures with the same starting address, regardless of their particular ID address.

ID addressing is also a tool for creating special lighting effects by having several fixtures sharing the same starting DMX address and ID address, as indicated below.

Single Row Connection

The figure below shows a simple DMX layout that uses four fixtures, all with the same DMX address and a unique ID address for each fixture. This allows the user to control simultaneously the whole group of units at that DMX address by setting ID Addressing channel to **0**. Similarly, the user can control each fixture at that DMX address independently by first selecting the DMX address and then using the ID Addressing channel to locate the target ID address.

Single Row ID Addressing Diagram

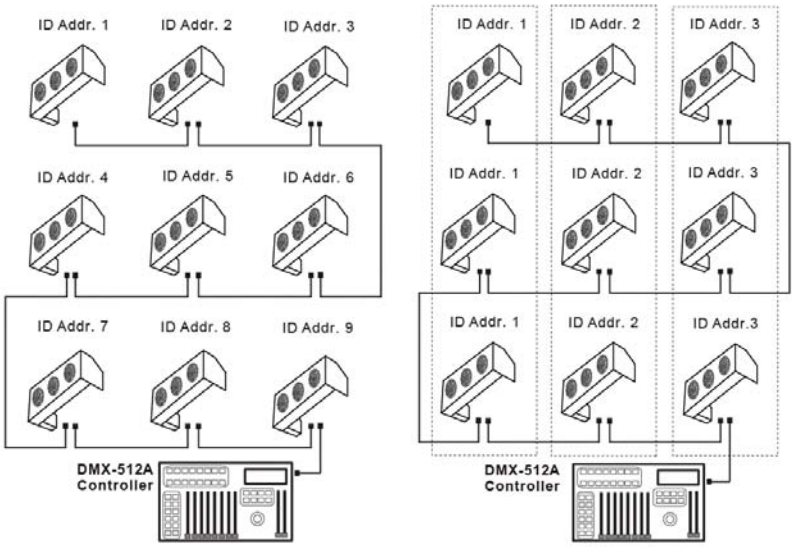


Standard Block Connection

In the Standard Block connection, the fixtures appear in repeated rows of the same length to form a block. For instance, three rows of fixtures with three fixtures per row to form a 3 x 3 block. Each of the fixtures has unique, sequential ascending ID addresses for the controller to control each fixture individually.

Repeated Row Block Connection

In this type of connection, the fixtures appear in repeated rows or columns of the same length to form a block. For instance, there may be three columns of fixtures with three fixtures per column to form a 3 x 3 block. In this case, the fixtures form groups, each with its own sequential ascending ID addresses. This way, the controller will control each group of fixtures individually.



Standard Block Connection **Repeated Block Connection**

Other Effects

For other types of effects, you may group the fixtures in diagonal lines or place them in random positions within a single block.

Sizing the Circuit Breakers

Calculating the total current drawn by the fixtures connected to a particular circuit is not complicated if the installer has the right information at hand and knows how to interpret it.

With the fixture's current draw information, the installer can calculate and select the right circuit breaker size (rating) to which they can connect a group of fixtures.

Using the Spec Sticker

CHAUVET® fixtures come with a sticker that indicates the current they consume in a circuit at the specified voltage. This greatly simplifies calculating the total current drawn.

For instance, if the sticker on the fixture indicates, "0.1 A @ 115 VAC, 60 Hz" and the installer is connecting 12 of them on the same 115 VAC circuit, to determine the total current required by the fixtures it would be enough to do this simple calculation:

0.1 A x 12 = 1.2 A

Using the Watts/Volts Method

Some installers may prefer to determine the current drawn by the fixture by dividing its power consumption, indicated in watts (W), by the voltage (V) on the circuit. As an example, assuming that a certain fixture consumes 240 W and it is connected to a 120 VAC circuit, the current it draws would be:

240 W / 120 V = 2 A

Considering the Power Factor

The above method is accurate only with fixtures whose power factor (PF) is equal, or very close, to "1." Otherwise, the calculated current may be too low with respect to the actual current drawn by the fixture.

In fact, as the PF decreases, the difference between the current calculated using the watts/volts method and the actual current increases.

Therefore, for fixtures with a PF below "0.9," the installer must always consider the fixture's PF when using the watts figure to calculate the current it draws.

For the above example, if the published fixture's PF were "0.7," the resulting drawn current would be as follows:

2 A / 0.7 = 2.8571 A

This is approximately equal≈(to 2.86 A, 2.9 A, or even 3 A, depending on the installer's desire for accuracy. In other words, the actual current ended up being close to 50% higher than originally calculated.

Using the Volt Amps Method

If the fixture's sticker indicates the power consumption in "volt amps" (VA), the calculation of the drawn current is simply the result of dividing the amount in VA by the voltage on the circuit (V). For a fixture with a consumption of 360 VA, the calculation would be as follows:

360 VA / 120 V = 3 A

Note that when the power consumption is in VA, the fixture's PF is never part of the current draw calculation.

Selecting the Circuit Breaker

The National Electric Code (NEC) determines that circuit breakers should handle 80% of their rated capacity for continuous loads (those being on for three or more hours) and 100% for intermittent loads. For safety reasons, CHAUVET® recommends assuming that all loads are continuous.

After calculating the total current the fixtures connected to a particular circuit will draw, the installer must consider the 80% rule indicated above. For a total current of 22 A, the calculation is as follows:

22 A * 1.25 = 27.5 A

The installer should use a 30 A CB because the immediately lower CB rating, 25 A, would not be enough for this load.

CHAUVET®
3000 N 29th Ct,
Hollywood, FL 33020 U.S.A.
(800) 762-1084 – (954) 929-1115
FAX (954) 929-5560
www.chauvetlighting.com

COLORado™ 2 Tour User Manual Rev. 01e
December 2009